CLAIMS

1. A method for the production of metallic nano-powder of a first metal or metals comprising;
   i. forming an alloy comprising said first metal or metals and at least one another second soluble metal;
   ii. applying first thermal treatment in the manner homogenized alloy is obtained;
   iii. applying a cold work to the homogenized alloy so thin strips are obtained;
   iv. applying a second thermal treatment to the alloy until a phase composition of predetermined characteristics is obtained;
   v. subjecting the said alloy to a leaching agent adapted to effectively leach out the least one soluble metal;
   vi. filtering and washing the powder;
   vii. drying the powder;
   viii. coating the powder with chemicals; and,
   ix. de-agglomerating the coated powder.

2. The method according to claim 1, wherein the first metal is selected from atoms of group I, IV, V, VI, VII and VIII of the periodic table of elements.

3. The method according to claim 2, wherein the first metal is selected from silver, copper, nickel, cobalt, titanium, silver, palladium, platinum, gold and iridium.

4. The method according to claim 1, wherein the first metal is selected from alloys comprising a blend of silver and at least one other metal, selected from atoms of group I, IV, V, VI, VII and VIII of the periodic table of elements.

5. The method according to claim 4, wherein at least one soluble metal blended in the silver alloy is selected from silver and at least one of the following metals: copper, aluminum, nickel, cobalt, titanium, silver, palladium, platinum, gold and iridium.

6. The method according to claim 1, wherein the at least one soluble metal is selected from aluminum, zinc, magnesium, tin, copper and silver.

7. The method according to claim 1, wherein the concentration of the at least one soluble metal is near saturation.

8. The method according to claim 1, wherein silver is the first metal and aluminum is the soluble metal.

9. The method according to claim 8, wherein the concentration of the soluble metal ingredient of the alloy is in the range between 5 to 50% w/w.

10. The method according to claim 1, wherein the leaching agent is selected from sodium hydroxide, potassium hydroxide, Acetic acid, hydrochloric acid, formic acid, sulfuric acid, nitric acid and hydrofluoric acid.

11. The method according to claim 1, additionally comprising a step of surface cleansing of the obtained strips by at least one cleaning agent.

12. The method according to claim 11, wherein the cleansing agent is selected from nitric acid, potassium hydroxide, sodium hydroxide or a mixture thereof.

13. The method according to claim 1, wherein the temperature ranges of first thermal treatment is about 400°C for 2 to 4 hours, or until homogenaized alloy is obtained.

14. The method according to claim 1, wherein the cold work is applied on the strip until the thickness of said strip is between 0.3 to 1.0 mm.

15. The method according to claim 1 adapted to silver-aluminum alloys, wherein the second thermal treatment is between 460 to 610°C.

16. The method according to claim 1, additionally comprising a step of quenching the strips obtained from the oven by means of immersing them in cold water, so the predetermined phase composition obtained during the heat treatment is provided.

17. The method according to claim 12, wherein sodium hydroxide is the leaching agent and the leaching temperature is between 36 to 80°C.

18. The method according to claim 17 wherein silver is the first metal and aluminum is the soluble metal and further wherein the concentration of the sodium hydroxide is between 25 to 55% (w/w) and the molar ratio of the aluminum to the said sodium hydroxide is between 5 to 6.

19. The method according to claim 1, wherein the obtained powder is filtered and washed by water so pH in the range of 6 to 7 is obtained.

20. The method according to claim 1, wherein at a maximum temperature of 45°C, the powder to a LOD weight ratio is lower 1%.

21. The method according to claim 1, wherein the chemicals for coating the powder are selected from sorbitan esters, polyoxyethylene esters, alcohols, glycerin, polyglycols, organic acids salts and esters, thiols, phosphines, acrylics and polyesters or any other suitable low molecular weight polymers or combination thereof.

22. The method according to claim 1, wherein the chemicals for coating the powder are admixed to the range of 1 to 5%, weight by weight based on the metal.

23. The method according to claim 1, wherein at least two different chemicals are used for coating the powder, at least one primary chemical is admixed in the range 1% to 5%, and at least one secondary chemical is admixed in the range of 0.1 to 2.5% weight by weight based on the metal.

24. The method according to claim 1, wherein the coating comprising;

i. dissolving the chemicals in a solvent;

ii. admixing the dissolved chemicals with the metal powder by an efficient mean;

iii. drying the slurry in an oven at low temperature.

25. The method according to claim 24, adapted to use a solvent of low boiling temperature.

26. The method according to claim 25, wherein the low boiling temperature solvent is selected from methanol, ethanol, isopropanol, acetone, water or combination thereof.

27. The method according to claim 24, adapted to use a ball mill is the efficient mean to admixed the dissolved chemicals with the metal powder.

28. The method according to claim 1, wherein the de-agglomerating the coated powder is enabled by means of a dry process, using at least one jet mill.

29. The method according to claim 1, wherein the de-agglomerating of the coated powder is enabled by means of a wet process, using effective means selected from of any suitable mechanical dispersers, mechanical homogenizes, ultra sonic homogenizes or any combination thereof.

30. A metallic powder produced by the method as defined in claim 1 or any of the preceding claims, wherein said powder comprises particles with grain sizes of 1 to 100 nm in at least one direction.

31. The nano-powder according to claim 30, wherein the metal is selected from the group I, IV, V, VI, VII and VIII of the periodic table of elements.

32. The nano-powder according to claim 30, wherein the metal is selected from silver, copper, nickel, cobalt, titanium, palladium, platinum, gold and iridium.

33. The nano-powder according to claim 30, wherein the metal is selected from alloys comprising a blend of silver and at least one other metal, selected from atoms of group I, IV, V, VI, VII and VIII of the periodic table of elements.

34. The nano-powder according to claim 30, comprising about 99.0 % to 99.55 % desired metal, and less then 1% soluble metal, having a specific area of about 6 to 25 m^2 per gram and average particle size of about 50 to 100 nm.